CLAIMS:

1. A superconducting ceramic of the general formula

$$(A_{1-x}B_x)_y\ Cu_z\ O_w \qquad \text{(i)}$$

in which $0.1 \leq x < 1$

$y = 2.0\text{-}4.0$

$z = 1.0\text{-}4.0$

$w = 4.0\text{-}10.0$

A is one or more rare earth elements and B is more than one alkaline earth element when A is one rare earth element, and is one or more alkaline earth elements when A is more than one rare earth element.

~~2. A superconducting ceramic according to claim 1, in which~~

~~$y = 2.5\text{-}3.5$~~

~~$z = 1.5\text{-}3.5$ and~~

~~$w = 6.0\text{-}8.0$.~~

3. A superconducting ceramic according to claim 1 of the general formula

$$(A_{1-x}B_x)_yCu_zO_w.(A_{1-x'}B'_{x'})_{y'}Cu_{z'}O_{w'} \qquad \text{(ii)}$$

in which $0.1 \leq \underline{x} < 1$

$0.1 \leq \underline{x}' < 1$

$\underline{y}$ = 2.0-4.0,

$\underline{y}'$ = 2.0-4.0,

$\underline{z}$ = 1.0-4.0,

$\underline{z}'$ = 1.0-4.0,

$\underline{w}$ = 4.0-10.0,

$\underline{w}'$ = 4.0-10.0,

A is one or more rare earth elements and B and B' are two or more alkaline earth elements.

4. A superconducting ceramic according to claim 3, in which

$\underline{y}$ = 2.5-3.5

$\underline{y}'$ = 2.5-3.5

$\underline{z}$ = 1.5-3.5

$\underline{z}'$ = 1.5-3.5

$\underline{w}$ = 6.0-8.0 and

$\underline{w}'$ = 6.0-8.0.

5. A superconducting ceramic according to claim 3 ~~or claim 4~~, in which A is one rare earth element.

6. A superconducting ceramic according to claim 5, having the stoichiometric formula $YbBaSrCu_3O_{6-8}$.

7. A superconducting ceramic according to claim 5, having the stoichiometric formula $YBaCaCu_3O_{6-8}$.

8. A superconducting ceramic according to claim 5, having the stoichiometric formula $YbBa_{0.7}Sr_{0.6}Ca_{0.6}Cu_3O_{6-8}$.

9. A superconducting ceramic according to claim 3 ~~or claim 4~~, in which A is more than one rare earth element.

10. A superconducting ceramic according to claim 9, having the stoichiometric formula $Y_{0.5}Yb_{0.5}BaSrCu_3O_{6-8}$.

11. A superconducting ceramic according to claim 9, having the stoichiometric formula $Y_{0.5}Yb_{0.5}BaCaCu_3O_{6-8}$.

12. A superconducting ceramic according to claim 1, of the general formula

$$[A_{1-x}(B_{1-q}B'_q)_x]_yCu_zO_w \qquad \text{(iii)}$$

in which $0.1 \leq \underline{x} < 1$

$0 < \underline{q} < 1$

$\underline{y}$ = 2.0-4.0,

$\underline{z}$ = 1.0-4.0,

$\underline{w}$ = 4.0-10.0,

A is a rare earth element and

B and B' are different alkaline earth elements.

13. A superconducting ceramic according to claim 12, in which

$\underline{y}$ = 2.5-3.5,

$\underline{z}$ = 1.5-3.5 and

$\underline{w}$ = 6.0-8.0.

14. A superconducting ceramic according to claim 1, of the general formula

$$[(A_{1-p}A'_p)_{1-x}(B_{1-q}B'_q)_x]_yCu_zO_w \qquad \text{(iv)}$$

in which $0.1 \leq \underline{x} < 1$

$0 < \underline{p} < 1$

$0 < \underline{q} < 1$

$\underline{y}$ = 2.0-4.0,

$\underline{z}$ = 1.0-4.0,

$\underline{w}$ = 4.0-10.0,

A and A' are different rare earth elements and

B and B' are different alkaline earth elements.

15. A superconducting ceramic according to claim 14, in which

$\underline{y}$ = 2.5-3.5

$\underline{z}$ = 1.5-3.5

$\underline{w}$ = 6.0-8.0.

16. A superconducting ceramic according to claim 1, of the general formula

$$/\bar{}(A_{1-p}A'_p)_{1-x}B_x\ \_^7{}_yCu_zO_w \qquad (v)$$

in which

$0.1 \leq \underline{x} < 1$

$0 < \underline{p} < 1$

$\underline{y}$ = 2.0-4.0,

$\underline{z}$ = 1.0-4.0,

$\underline{w}$ = 4.0-10.0,

A and A' are different rare earth elements and

B is an alkaline earth element.

~~17. A superconducting ceramic according to claim 16,~~ in which

$\underline{y}$ = 2.5-3.5

$\underline{z}$ = 1.5-3.5

~~$\underline{w}$ = 6.0-8.0.~~

18. A superconducting ceramic according to claim ~~17~~ 16, having the stoichiometric formula $Y_{0.5}Gd_{0.5}Ba_2Cu_3O_{6-8}$.

19. A superconducting ceramic according to claim ~~18~~ 16, having the stoichiometric formula $Y_{0.5}Yb_{0.5}Ba_2Cu_3O_{6-8}$.

20. A method for producing a superconducting ceramic according to any one of claims 1 to 19, which comprises

mixing together stoichiometric amounts of the oxides and/or carbides of the constituent metals, in powder form, compressing the mixture to a desired shape and sintering the mixture at an elevated temperature.

21. A superconducting ceramic comprising two or more rare earth elements and/or two or more alkaline earth elements and having a polycrystalline perovskite-like structure of large crystalline particles providing reduced interfacial areas between crystalline particles and correspondingly elevated superconducting onset temperature.